

16 December 2011

Ms. Anne Olson
Regional Water Quality Control Board
Central Valley Region
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Tentative Waste Discharge Requirements Order for City of Hughson Wastewater Treatment Facility, Stanislaus County

This letter transmits my written comments on the subject Tentative Waste Discharge Requirements Order for the City of Hughson Wastewater Treatment Facility (WWTF). I am a resident of Fresno County and a California registered civil engineer with 12 years experience working for the Central Valley Water Board in the WDR regulatory program. I have expertise in evaluating the effects to soil and groundwater from municipal wastewater and sludge treatment facilities and discharges of treated wastewater to land for disposal. I submit the following recommendations in the hope that Central Valley Water Board staff will revise the Tentative Order accordingly, or provide technical justification to the Central Valley Water Board why staff does not concur with my recommendations.

1. Finding 9, second states, "In January 2005, the Discharger began regulating DFA under a pretreatment program, which sets effluent limits for biological oxygen demand, fats and grease, and salinity." The correct technical term is "biochemical oxygen demand." Staff should perform a search for "biological oxygen demand" in all the tentative Order's documents and replace "biological" with "biochemical." Also, section "a" of this finding refers to a "dissolved air floatation unit." The correct technical term is "dissolved air flotation."
2. Finding 19 indicates the City of Hughson (Discharger) proposes to cease chlorine disinfection of WWTF effluent because it caused groundwater affected by the discharge to contain elevated concentrations of total trihalomethanes (TTHMs). The finding also indicates that the occurrences of total coliform organisms in groundwater monitoring wells have decreased since the Discharger disinfected the wells and implemented improved sampling techniques. Finding 34 presents water quality data from the Discharger's groundwater monitoring well network for Total Dissolved Solids (TDS), chloride, sodium, nitrate-nitrogen, total THMs, and total coliform. It is difficult to evaluate the discharge's influence on groundwater without data on effluent chloride and sodium concentrations and without data on groundwater total organic carbon (TOC) concentrations. Given the nature of the discharge (treated municipal wastewater), the discharge has probably degraded groundwater from TOC. Unfortunately, the tentative Order does not provide data to evaluate the extent to which affected groundwater contains elevated TOC concentrations. While the Basin Plan does not establish a water quality objective for TOC, elevated TOC concentrations in groundwater contribute to reducing conditions that cause groundwater iron, manganese, and arsenic concentrations to increase to levels that may exceed applicable water quality objectives.
Recommendation 1. Revise Finding 26, which presents City's source water and WWTF effluent quality data, to include data characterizing the discharge's chloride, sodium, and total THMs concentrations. **Recommendation 2.** Revise Finding 34 to include data, if available, to characterize groundwater TOC concentrations.

3. Finding 35 states, “Because of the distinct groundwater mound created by the ponds, MW-10 is not completely upgradient of the WWTF. However, the monitoring data from MW-10 and its location relative to the WWTF indicate that it is representative of shallow background groundwater quality and is unaffected by the wastewater treatment plant discharge. Additionally, THMs have not been detected in MW-10 as they have in downgradient monitoring wells closer to the ponds. Therefore, MW-10 is considered to be representative of background groundwater quality.” While data provided in Finding 34 supports the finding’s conclusion that groundwater passing through MW-10 “is unaffected by the wastewater treatment plant discharge,” it does not provide adequate technical information to support its conclusion that MW-10 is “representative of shallow background groundwater quality,” especially in light of water quality data obtained from MW-9, MW-12, and MW-13, as discussed in Item 6 below.
4. Finding 36 states, “In general, background groundwater quality, as indicated by MW-10, is not as good as downgradient groundwater quality closer to the ponds; therefore it appears that no degradation of groundwater quality is occurring as a result of the discharge.” This conclusion contradicts the data presented in Finding 34, which shows affected groundwater contains detectable concentrations of total THMs and concentrations of nitrate-nitrogen exceeding the water quality objective of 10 mg/L. Finding 26 indicates that the City’s source water contains detectable concentrations of total THMs. Without implementing treatment to remove THMs (e.g., treatment with activated carbon or by reverse osmosis), WWTF effluent will likely contain THMs in detectable concentrations. Therefore, absent sufficient THMs attenuation in the vadose zone, the discharge will continue to degrade groundwater from THMs. It also threatens to degrade groundwater and surface water (Tuolumne River) from constituents of emerging concern (e.g., personal care products and pharmaceuticals), many of which may act as endocrine disruptors in humans and wildlife. **Recommendation 3.** Revise Finding 26 to indicate the discharge has degraded groundwater from THMs and also possibly from constituents of emerging concern that have not yet been characterized in the discharge.
5. Finding 37 refers to periods of extended conditions of below average rainfall as “draught conditions.” The correct term is “drought conditions.”
6. Finding 38 indicates MW-9 and MW-12 are downgradient of an existing orchard. MW-13 is also downgradient of an existing orchard and southwest of Ponds 1W and 2W. Data from all three wells presented in the tentative Order predate any discharge to Ponds 1W and 2W. According to data presented in Finding 34, groundwater passing through MW-9 contains, on average, 407 mg/L TDS, 20 mg/L chloride, and 60 mg/L sodium; groundwater passing through MW-12 contains, on average, 512 mg/L TDS, 46 mg/L chloride, and 120 mg/L sodium; and groundwater passing through MW-13 contains, on average, 279 mg/L TDS, 16 mg/L chloride, and 35 mg/L sodium. In contrast, groundwater passing through MW-10, the Discharger’s sole background well for compliance and enforcement purposes, contains, on average, 1180 mg/L TDS, 136 mg/L chloride, and 250 mg/L sodium. These facts demonstrate that groundwater upgradient of the discharge is of variable quality with respect to salinity constituents, and calls into question the tentative Order’s designation of MW-10 as the Discharger’s sole upgradient well for compliance and enforcement purposes.

Additionally, data in Finding 34 for MW-4, MW-5, and MW-6 (wells clearly influenced by the discharge) show average TDS concentrations ranging from 515 to 555 mg/L, average chloride

concentrations ranging from 84 to 91 mg/L, and average sodium concentrations ranging from 132 to 140 mg/L. Because TDS, chloride, and sodium concentrations in groundwater passing through MW-9, MW-12, and MW-13 are lower than those in MW-4, MW-5, and MW-6, Finding 36 is incorrect in its assertion that “it appears that no degradation of groundwater quality is occurring as a result of the discharge.” **Recommendation 4.** Revise Finding 36 to indicate that the discharge threatens to degrade groundwater from TDS, chloride, and sodium. **Recommendation 5.** The tentative Order should require the Discharger to install at least one additional background well in a location beyond the groundwater mound created by the discharge and away from concentrated sources of waste constituents.

7. Findings 46 through 51 concern the discharge’s consistency with Resolution 68-16. None of the findings indicates whether the Discharger performed an antidegradation analysis for the proposed increase in discharge flow, which is typically part of a discharger’s report of waste discharge. **Recommendation 6.** Revise one of these findings to indicate whether the Discharger’s report of waste discharge included an antidegradation analysis and whether the analysis was adequate.
8. Finding 48 states, “The Discharger has been monitoring groundwater quality at the current WWTF site since 2001. Based on the data available, it is not possible to determine pre-1968 groundwater quality.” This conclusion appears to be based solely on the fact that the Discharger did not implement groundwater monitoring until 2001. However, there may be sources of historic groundwater data compiled by other agencies (e.g., USGS, Stanislaus County, local irrigation district) that should have been checked to rule out the existence of pre-2001 data to conclude “determination of compliance with Resolution 68-16 for this facility must be based on existing background groundwater quality.” **Recommendation 7.** Revise this finding to identify the sources of historical groundwater data (e.g. USGS, local irrigation districts, etc.) that were checked to rule out the existence of pre-2001 data on groundwater conditions in the discharge vicinity.
9. Finding 49(a) relies on groundwater data from MW-10 to assert that discharge quality for salinity constituents is better than background and to conclude the discharge “is not likely to degrade groundwater quality due to increased salinity and a TDS effluent limit is not required to protect groundwater quality.” As indicated above, groundwater passing through wells in the vicinity of the Discharger’s new disposal ponds prior to the initiation of discharge to these ponds is characterized, in large part, by appreciably lower concentrations of TDS, chloride, and sodium compared to groundwater passing through MW-10 (and also passing through MW-4 through MW-6). **Recommendation 8.** Staff should (a) re-evaluate its sole reliance on MW-10 to characterize background quality for salinity constituents; (b) use data from MW-9, MW-12, and MW-13 obtained prior to initiation of discharge to Ponds 1W and 2W to characterize background quality for salinity constituents; and (c) propose effluent limitations for TDS, chloride, and sodium that will be effective to ensure the discharge will not impair the beneficial uses of area groundwater for municipal, agricultural, and industrial supply.
10. Finding 49(b) uses groundwater data from MW-10 to characterize background groundwater as containing, on average, 40 mg/L nitrate-nitrogen, which is four times the applicable water quality objective of 10 mg/L (45 mg/L as nitrate). The Discharger’s treatment facility is capable of generating an effluent containing on average 5.5 mg/L each BOD₅ and nitrate-nitrogen. Because of the discharge’s low nitrate concentration, the finding asserts the discharge will not cause groundwater to contain nitrate-nitrogen in concentrations exceeding background conditions. The

Basin Plan establishes that water quality objectives are to be achieved primarily through the adoption of waste discharge requirements. Therefore, it is the Board's responsibility to adopt waste discharge requirements that ensure the authorized discharge will not cause exceedances of applicable water quality objectives in the receiving water. Groundwater data presented in Finding 34 indicates groundwater affected by the discharge contains, at times, nitrate-nitrogen concentrations exceeding 10 mg/L. This should be sufficient justification for the tentative Order to establish an effluent limitation for nitrate-nitrogen (e.g., 10 mg/L monthly average) to ensure the Discharger continues to operate its treatment facility in a manner that consistently achieves effluent nitrate-nitrogen concentrations of 10 mg/L or lower. **Recommendation 9.** The tentative Order should establish an effluent limitation for nitrate-nitrogen of 10 mg/L as a monthly average. Alternatively, the tentative Order should establish monthly average and daily maximum effluent limitations for BOD₅ of 10 mg/L and 15 mg/L (not 40 mg/L and 80 mg/L as proposed) to ensure effluent nitrate-nitrogen concentrations will be consistently less than 10 mg/L.

11. Finding 63 states, "Based on the threat and complexity of the discharge, the facility is determined to be classified as 3-B...." It is unlikely that the Discharger will be able to demonstrate that all coliform detections in groundwater monitoring wells were due solely to inadequate well seals and sampling protocols. Absent a requirement for effluent disinfection, the discharge of up to 135 feet per year of undisinfected municipal effluent in rapid infiltration ponds threatens to impair the beneficial uses of affected groundwater for municipal and domestic use, and cause short-term violations in groundwater of the bacteria water quality objective. Also, because the City's source water contains THMs, the discharge threatens to cause short-term violations of the toxicity water quality objective. Additionally, due to the nature of the waste undergoing treatment (municipal sewage), the treatment facility has the potential to create nuisance. Title 23, California Code of Regulations (CCR), Section 2200, defines Category 2 threat to water quality as: "Those discharges of waste that could impair the designated beneficial uses of the receiving water, cause short-term violations of water quality objectives, cause secondary drinking water standards to be violated, or cause a nuisance." Additionally, the tentative Order requires the Discharger to continue to operate a groundwater monitoring well network (the current network has 11 wells). Title 23, CCR, Section 2200 defines Category A complexity as: "Any discharge of toxic waste, any small volume discharge containing toxic waste or having numerous discharge points **or ground water monitoring**, or Class 1 waste management unit" (emphasis added). Staff is interpreting the discharge's threat and complexity in a manner that is inconsistent with the definitions provided in Section 2200 and with past practices by staff. It appears that staff is incorrectly applying the threat and complexity definitions to artificially reduce the Discharger's annual fee. State Board establishes annual discharge fees and threat and complexity definitions, and allocates the resulting funds to the regional boards for core regulatory work. By artificially reducing the annual fees (by misapplying Section 2200 definitions), staff is reducing the amount of funding the regional boards require to perform basic regulatory work. In this particular case, staff's incorrect interpretation of Title 23, CCR, Section 2200 results in the Discharger paying \$10,801 less annually than is required by the regulation. **Recommendation 10.** Revise Finding 63 to classify the discharge as 2-A. I respectfully request staff fully respond to this comment and recommendation.
12. Finding 67 states, "Although the WWTF is exempt from Title 27, the data analysis methods of Title 27 are appropriate for determining whether the discharge complies with Groundwater Limitations." Title 27 is a regulatory program for discharges that must be contained and not release waste constituents to groundwater (e.g., hazardous waste surface impoundments, municipal solid

waste landfills). Because of its “no discharge” requirement, Title 27 requires the use of statistical methods that serve to detect whether a release has occurred. The tentative Order, on the other hand, authorizes an annual discharge to groundwater of up to 700 million gallons of treated municipal sewage. Because many waste constituents in the discharge are present naturally in groundwater, the use of Title 27 statistical methods tend to result in background concentrations that can be several orders of magnitude higher than average values. Orders that require a discharge to groundwater to not cause groundwater to “contain waste constituents in concentrations statistically greater than background groundwater quality” (Groundwater Limitation E.1) and that specify the use of Title 27 statistical methods for evaluating compliance are essentially licenses to pollute and are not compliant with the Basin Plan. **Recommendation 11.** Revise Finding 67 to restrict the use of Title 27 statistical methods to waste constituents not naturally present in groundwater (e.g., total THMs).

13. With the exception of total coliform organism level and pH, the tentative Order’s Groundwater Limitations do not establish numerical receiving water limits that reflect the Discharger’s implementation of best practicable treatment or control. Without such numerical limits, the Order becomes essentially unenforceable save for its “no pollution” requirement (Discharge Specification B.2). **Recommendation 12.** Groundwater Limitation E.1 should be eliminated and replaced with a suite of numerical limitations for waste constituents of concern that reflects the Discharger’s implementation of best practicable treatment or control. This would make the tentative Order similar to the many municipal waste discharge requirements orders adopted by the Board during the last 10 years.
14. Provisions F.1 through F.4 all rely on MW-10 as being the sole groundwater well to represent background conditions. As noted above, groundwater data from MW-9, MW-12, and MW-13 all show groundwater quality that is better than MW-10. **Recommendation 13.** The tentative Order should require the Discharger to install at least one additional upgradient groundwater well and the data from this well, along with MW-10, should be used for characterizing background quality.
15. Provision F. 8 states, “The Discharger shall use the best practicable cost-effective control techniques(s) including proper operation and maintenance, to comply with discharge limits specified in this order.” This requirement implies that staff may initiate enforcement against the Discharger for implementing techniques that are not cost effective, which I believe is not the intent of this provision. **Recommendation 14.** Revise this provision to read: “The Discharger shall implement best practicable treatment or control, including proper operation and maintenance, to comply with this order’s requirements.”
16. The Tentative Order’s Monitoring and Reporting Program identifies the constituents to be monitored in the Plant’s wastewater treatment system’s influent and effluent, as well as source water and groundwater.
 - 16.1. **Recommendation 15:** The MRP should require 24-hour composite monitoring of influent and effluent for BOD₅. Twenty-four-hour composite sampling of municipal sewage is a standard practice for municipal sewage treatment facilities of the size and type of the Discharger’s, and provides representative data of the influent. Twenty-four-hour composite sampling of the discharge is appropriate because of the relatively short detention time provided by the facility’s oxidation ponds. Grab sampling of influent and effluent does not

reflect implementation of best practicable control.

- 16.2. **Recommendation 16:** The MRP should include TOC in the list of constituents to be monitored in groundwater. As explained above, TOC is a useful indicator constituent and data on groundwater TOC levels is useful in evaluating the extent to which TOC is attenuating in the vadose zone, and for interpreting instances of elevated iron, manganese, or arsenic levels in groundwater affected by the discharge.
- 16.3. **Recommendation 17:** The MRP should require quarterly monitoring of groundwater. This is necessary to evaluate trends in groundwater quality and, should a statistical analysis of certain waste constituents be determined appropriate for compliance purposes, ensures that staff will have sufficient data to allow for such an analysis within a reasonable amount of time.

I appreciate the opportunity to submit these comments.

A handwritten signature in black ink, reading "Jo Anne Kipps". The signature is fluid and cursive, with the first name "Jo" being particularly prominent.

Jo Anne Kipps
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